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## THE RELATIONSHIPS AMONG PLANTS, ANIMALS, AND MAN IN THE AFRICAN TROPICAL RAIN FOREST

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**ABSTRACT** Interrelationship among man, plants and animals in the Ituri Forest is described and analyzed. Plants contribute mainly to establish the material world of forest foragers, and their eternity gives man and animals living in the forest a sense of security and certainty for life. Animals are characterized by an ontological duality. They are like man and differ from it. They interact with man actively, emotionally and ambivalently. Animal meat is highly prized as food but it is often connected with food taboo. Animals bring joys and happiness to man, but also perform as agents of various diseases. Both plants and animals provide many possibilities of uses on which forest people construct their material, social, symbolic and spiritual life. Finally the cosmology of forest foragers concerning the relationship between man and nature is compared with that of Western people and Buddhism.

**Key Words:** the Pygmies; Hunter-gatherers; Ituri Forest; Plant use; Food taboo; Disease; Man and nature

### INTRODUCTION

The people of the African tropical rain forests have strong relationships with their natural environment. There are more than thousands of vascular plants, more than 60 mammals (Carpaneto et Germei, 1989), more than 600 of birds (Schouteden, 1963), and innumerable other animals. Surrounded by such a rich environment, the forest foragers, known as the Pygmies, make a living relying on those natural resources. The natural environment plays an important role not only in practical and material aspects of everyday life, but also in social and spiritual aspects of the life of the forest foragers.

The aim of this paper is, firstly, to show how wild plants and animals contribute to the life of forest foragers in all its aspects. The ways in which the forest foragers use and identify wild plants and animals are described and analyzed. With plants, the forest foragers seem to have a primarily utilitarian relationship. But plants are not only objects of exploitation. Plants are immobile but they interact with man in various ways. With regard to animals, the relationships between man and animals are described and analyzed in terms of food restrictions and diseases. Animals are good food but also good friends and sometimes ambivalent creatures for man. In the world of forest foragers animals present themselves as partners in the interaction with man. Although it is true that for any people in the world animals and plants

are of vital importance, the relationships between plants, animals and man differ. At the end of this paper, I will discuss the characteristics of the relationship between the nature and man among the forest foragers.

## PLANTS AND MEN

### I. Plant Use in the Ituri Forest

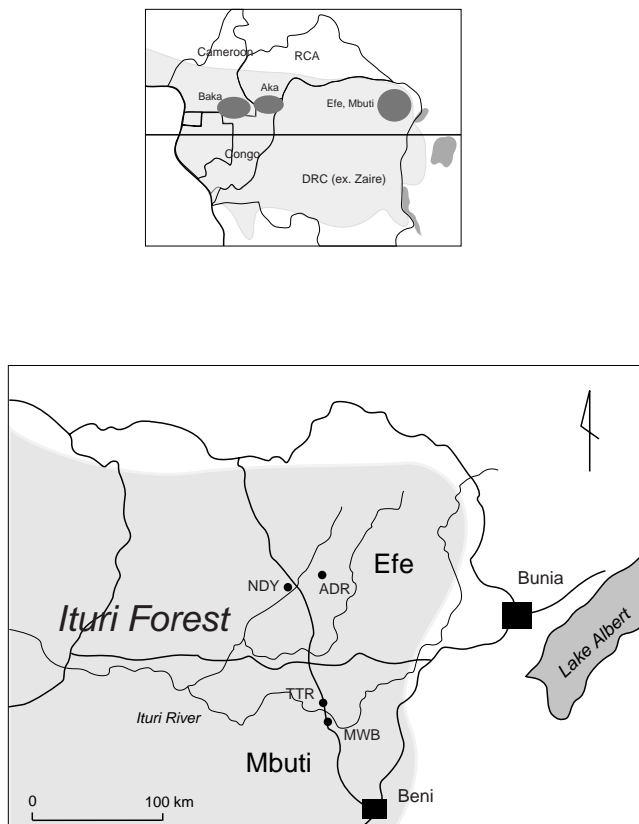
Plants contribute greatly to various practical human needs such as food, medicine, material culture, ritual and so on. In the Ituri Forest of the Democratic Republic of Congo (former Zaire), we conducted an ethnobotanical survey between the late 1970s and 1990 to find out how people identify and use the plants around them. More than 1,100 voucher specimens were collected working with four local groups of Ituri Pygmies: Two Mbuti groups (Mawambo [MWB] and Teturi [TTR]) and two Efe groups (Andiri [ADR] and Nduye [NDY]) (Fig. 1).

The Pygmies of the Ituri Forest have had close relationships with neighboring farmers for centuries, and according to the farmers they associate with, the Pygmies are divided into two major groups. One group, called Mbuti, has close contact with the Bira farmers living in the central and southern parts of the forest, speaking Bira as their mother tongue. The other group, called Efe, has close contact with the Lese farmers living in the north and eastern parts of the forest, speaking Lese as their mother tongue. The Mbuti groups associated with the Bira are net-hunters because they do net hunting as their common hunting activity, and the Efe are archers because they do bow and arrow hunting instead of net-hunting (Harako, 1976; Ichikawa, 1981; Terashima, 1983).

Most of the plants collected by us were deemed useful by the local people. Among the collected plants, the number of plants identified at the species level reached over 750 (Ichikawa & Terashima, 1996). To establish the use pattern of plants, we classified the plants into ten use categories (Table 1). Plants which have more than one use are classified into each category. The result is shown in Fig. 2. The use most frequently mentioned is that of material culture (372 species). This is followed by ritual use (235 species) and medicinal use (220 species). The number of plants used as food was 123 and those as poison was 103. Fig. 3 illustrates the variation of use patterns among the four Ituri forager groups. Although some differences are found, the general pattern of use categories appears to be almost the same.

The use of plants for material culture includes plants for making cords, baskets and mats, bark cloth, wrapping, bows and arrows, handles of axes, knives and spears, strings for hunting nets, for house construction and so on. Nearly a half of the plants collected are in this category. And in each local group, this was the most frequently mentioned category.

The ritual use of plants includes plants used for rituals such as funerals, weddings and initiations. The plants for sorcery, and for good luck in various activities are included in this category, too.



**Fig. 1.** Study site.

The plants used as medicine include plants to cure general diseases such as headache, fever, stomach ache, diarrhea, injury, injury by fire and so on. There are some diseases which are mainly caused by the violation of food restrictions. The most important of these is called *eke* among the Efe or *kuweri* among the Mbuti. Such diseases are caused if a child or its parents eat taboo animals. The plants used for treating these diseases are included in the category of medicines. The plants used for treating sorcery are included in the category of ritual use. In the four groups of Ituri foragers, almost the same number of plants are used for ritual and for medicinal purposes. Many plants used as medicines have also symbolic meanings. Sometimes it is difficult to distinguish medicinal and ritual uses. In such a case we have treated the uses to belong to both categories.

The food category includes those plants that produce edible fruit, nuts, roots, and so on. In the four groups nearly the same number of plants, around 60, are reported to be used for food.

The poison category includes mainly the poisons for arrowheads and some for fishing. Although the total number of plants used for poison in all four groups is

**Table 1.** Use Categories.

Use Category	Notes
A: Medicine	medicines for ordinary medical treatments
B: Food	general food and drink, material for alcoholic drinks
C: Material culture	materials for making objects
D: Ritual	magic, ritual, religious objects
E: Poison	poisons for arrowheads, fishing, ordeal, sorcery, etc.
F: Narcotics	narcotic drinks, seasonings, smoking, etc.
G: Oral tradition, indicators	songs, sayings, aphorisms, legends, myths, indicators of natural phenomenon, etc.
H: Indirect	plants used indirectly such as fodder plants, honey plants, etc.
I: Wild Animals	plants serving as food, dwellings or something for wild animals
J: Others	

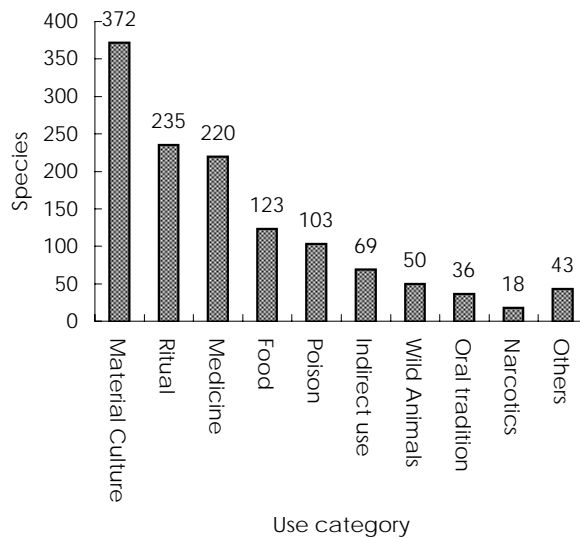
almost the same as that for food (Fig. 2), it is only in the case of the Mawambo group that the plants for poison exceed the half of the numbers of plants for food (Fig. 3).

## II. Necessities and Diversity

From the data of plant use, we can discern several points that reveal the characteristics of the relationship between plants and man in the Ituri Forest. Firstly, the number of plant species in each use category can be considered as an index of human needs for daily life. It is quite obvious that material culture, health, and food are the basic needs of the forest people. To this extent, people have practical and material relations with plants. It is, however, noteworthy that many plants are also used for ritual purposes. It seems clear that the symbolic meanings of plants have basic importance in the life of forest foragers. Without the plants, people cannot make up their life. We also have to note that plants provide animals with a diet, dwellings and everything they need.

Among the Ituri foragers, however, plants are not always used in the same way. On the contrary, a large variation of plant use is found among the local groups (Terashima, 1995; Ichikawa & Terashima, 1996). The same plants are not used in the same way by all groups, and, different plants are used for the same purposes by those groups. For example, more than a half of the food plants collected in one group are not considered as food in another group. Commonalities with regard to medicinal and ritual use are extremely rare.

Generally speaking, plant use is determined by both physical and chemical characteristics of the plant itself and by cultural tradition. Such a large diversity of plant use as observed among the Ituri forest foragers is a product of differences in



**Fig. 2.** Plant species for each use category.

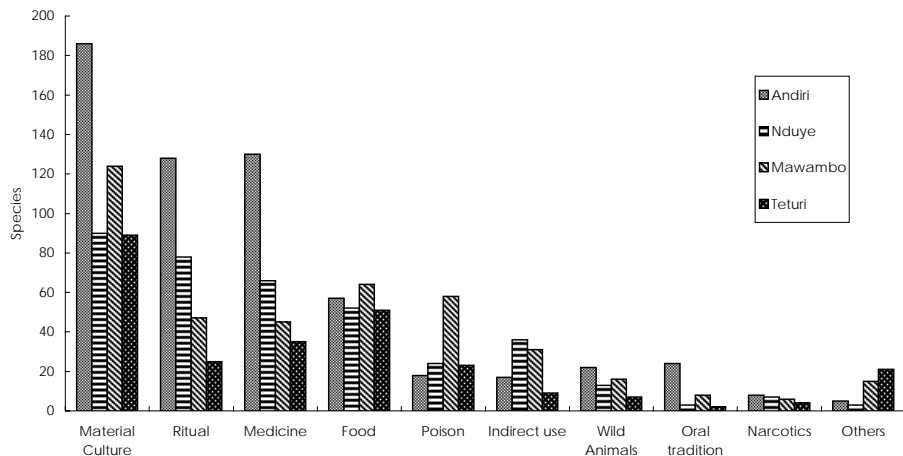
the cultural traditions of these groups, since the natural environment seems almost the same throughout the forest. We should, however, notice that the great diversity of tropical rain forest flora provides a wide range of possibilities to culturally select plants.

At the same time it should be noted that people are not only following traditions. People are seeking new possibilities of plant uses everyday. Wandering in the forest they carefully observe the plant life. When a plant calls their attention, they consider and test its potential either practically or only in their imagination, and they add it to their repertoire of knowledge if they find it useful or interesting. In this way people hear messages from the plants and converse with them.

### III. Classification and Use

The Ituri forest foragers classify plants into three explicit life form categories: 1) trees, 2) herbs and 3) climbing plants. These categories have some relationships with the use of the plants, especially in the case of material culture. For example, only hard woody plants are needed for a certain use, as spear shafts or as handles of axes, and vine-like flexible plants are indispensable as a binding material in house construction. For food, medicine and ritual practices, however, there seems to be no specific relationships between uses and plant types. The differences between plant types usually do not have symbolic meanings.

The system of plant classification among the forest foragers is very simple. It lacks a hierarchical structure. In the Ituri Forest, it is apparent that plants which



**Fig. 3.** Plant species for each use category among the Ituri foragers.

are considered as useful always named. By contrast, those plants which are not considered useful, often have no vernacular names, even if they have colorful flowers or other conspicuous features for us. People have no concerns for such characteristics of the plants. In the Ituri Forest, plants are named and classified not because they are ‘good to think,’ but because they are ‘good to use.’ Of course, plants without explicit use may have vernacular names. In such cases, people identify some special interest such as symbolic meanings other than practical uses for the plants. People classify and name the plants around them from the viewpoint of their usefulness and interest for man.

#### IV. Interaction between Man and Plants

Some plants are believed to do harm to man and animals when they are damaged. Among those plants is the *akobishi* (*Uvariopsis congolana* (De Wild.) R. E. Fr.), a small tree of Annonaceae family. It is prohibited doing any harm to the tree everywhere in the Ituri Forest. People say it must be left as it is. It is reported that if a person happens to damage it, all the members in the camp have to sing and dance around a fire at the center of which the twig of the tree is placed (Terashima & Ichikawa, n.d.). Some plants are said to deliver messages on natural, or human events such as death of somebody.

Most plants, however, do not act by themselves. That is, they have passive relationships with man. Even the plants used for sorcery are usually harmless by themselves. Only when they are used by some people with bad intentions, they become harmful. In this sense, plants are in the background of human life. It may be misleading, however, to see the plants only as passive and exploitable resources for the forest foragers. The usefulness of a plant is not always inherent to the plant itself. Forest people hear messages from the plants and find their usefulness

through conversation with them. The usefulness of the plants depends on the interaction between plants and man. This is especially apparent for the symbolical uses of plants. The usefulness of a plant as ritual medicine depends not only on the physical features of the plant but also on the knowledge and skill of the practitioner who manages to interact with the plant and draw its hidden power from the plant.

Another important feature that characterizes plants is their continuity or eternity. Of course people well understand the life cycle of the plants in a biological sense. Individual plants start their life by germination and grow, produce fruit, and end with death. The plants, however, have no individuality like animals. Their life is not like that of animals. We were often astonished by the indifference of the forest people to the care for young plants which would produce useful fruit or material for man in the future. They cut down or slash such plants growing by the paths in the forest. This does not mean, however, that the forest people pay no attention to the protection of natural environment at all. It is that the plants are something beyond individuality and the care should be devoted to the forest as whole, and not to each plant. Each plant is embedded in the forest, therefore it has an eternal existence like the forest itself. With this eternity or continuity of life, plants present themselves as the symbol of forest and nature, and provide man and animals with feelings of reliability and certainty.

## ANIMALS AND MAN

In the folk taxonomy of the forest foragers, animals are divided into several large categories: mammals, birds, snakes, fish, invertebrates and so on. Here I sort them into four groups for the convenience of analysis: (1) mammals, (2) birds, (3) reptiles, amphibians and fish, and (4) insects and other invertebrates. The relationship with humans differs considerably according to each animal group. Some animals such as small insects which have no meaning to man are considered as if they were 'lifeless things' usually having no vernacular names. Among the Efe of Andiri, ethnozoological information was collected by the author for 61 mammals, 73 birds, 19 reptiles, amphibians and fish, 31 insects and other invertebrates.

### I. Animals for Practical Uses

For hunter-gatherers, animals are very important food. Although it is held that plant food plays a more substantial role as everyday nourishment than animal food for hunter-gatherers who live in the low latitudes, the value of animal meat is still vital in nutritional sense since it provides at least 20% of the diet (Lee, 1968; Tanaka, 1980: 70). Moreover, animal meat has a spiritual value which plant food cannot give to man. In San hunter-gatherers, animal meat is considered to be 'the true food' (Tanaka, 1980: 74).

Compared to the use as food, other uses of animals, such as medicine, material culture, ritual, and so on are not so frequent. Among the Efe of Andiri, only 6 kinds of medicine are made from animal or animal-related materials. Tanno



(1984) reported that among the materials used for their material culture, 69 (70%) items were from plants, and 14 (14%) were from animals. Those figures are much different from that of the San hunter-gatherers where plant materials accounted for only 36% while animal materials accounted for 42% (Tanaka 1978). The difference is probably due to the environmental difference: the Pygmies live in the forest while the San live in the arid savanna.

Among the Efe of Andiri, animal skin is used for wrist protectors, caps, drum skins, loincloths, ornaments of bows or flutes, and so on. The horn of a duiker is used as a container for medicine. Some animal materials are used for sorcery or as charms against sorcery and misfortune. For example, the teeth of leopard, tree hyrax, and hippopotamus, the bone of a lion, chimpanzee, tree hyrax, and giant otter shrew, the skin of a lion, tree hyrax and giant otter shrew are popular items for sorcery or against sorcery. The number of animals, however, used for practical purposes except for food is much less than that of plants.

## II. Good to Eat and Bad to Eat

One of the characteristics that the animals have is that they convey strong symbolical meaning. Especially animals as food are filled with symbolic meaning. There are many food restrictions with regard to animals. Many animals are considered to be food but they are not eaten freely. An animal can be good to eat for someone, but bad for another person. And some animals are good to eat sometimes, but bad at another point in time.

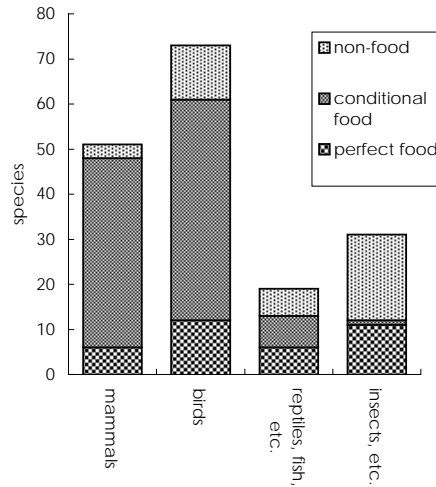
In terms of food restrictions animals can be classified into three categories:

1. animals that are perfectly good food, that is, edible for anybody at any occasion.
2. animals that are bad or non food, that is, unedible for anybody at any occasion.
3. animals that are conditional food, that is, good to eat for some at some occasions.

In Fig. 4, the proportions of animal types in each animal group observed among the Efe of Andiri are shown. The proportions are fairly different according to animal groups.

As for the mammals, almost all of them are considered as food, but most of them are conditional food. The numbers of perfect food and non-food are very small. Among 51 mammals, six species (Black-fronted duiker, Okapi, Dark mongoose, Marsh mongoose, Blue monkey, Potto) are considered to be perfect food, three species (Hippopotamus, Leopard, Abyssinian black and white colobus) are non-food; the remaining 42 species are conditional food. A similar situation applies to birds. Many birds are considered as food, but 49 of 73 species (67%) are considered conditional food.

Information on reptiles, amphibians and fish has not been sufficient compared to those on mammals and birds. From the information gathered on about 30 species commonly seen, it seems clear that the reptiles, amphibians and fish group includes



**Fig. 4.** Food types in each animal group.

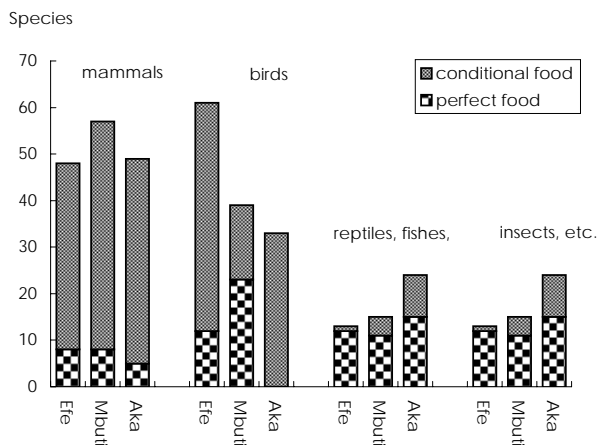
more animals which are either perfect food or non-food and less animals which are conditional food.

Insects and other invertebrates are more clearly divided into just two categories: perfect food and non-food. For example, in the Ituri Forest, there are several kinds of edible larvae including wild silkworms called *munjaku* which are very important food from August to October. People gather and eat them almost every day and none of them are restricted food. There are very few species which are conditional food among the insects and other invertebrates.

In Fig. 5, the food restriction patterns of three Pygmy groups (Efe, Mbuti, Aka) are illustrated. Almost an identical food restriction pattern is apparent. That is, mammals and birds are mostly used as food but mostly restricted, while in the other groups, there are fewer food species and less restrictions. It seems apparent that the degree of prohibitions indicates the relevance of an animal for humans.

### III. Type of Food Restrictions

Here I describe and discuss the animal food restrictions drawing mainly on the data obtained among the Efe of Andiri. The food restrictions observed by the Efe of Andiri are classified roughly into two types. The first kind of restriction is concerned with the individual's permanent attributes such as kinship affiliation, sex, and so on. Among Ituri foragers people are affiliated to patrilineal descent groups which work as the core of social grouping called 'band.' Among the Efe, each patrilineal descent group has its own animal which the member of the group cannot eat because it is *anutela* (prohibited food). Each group also has an animal called *gou* (or *mou*) into which people think they will transform after death. The



**Fig. 5.** Food type and animal category in three forest forager groups.

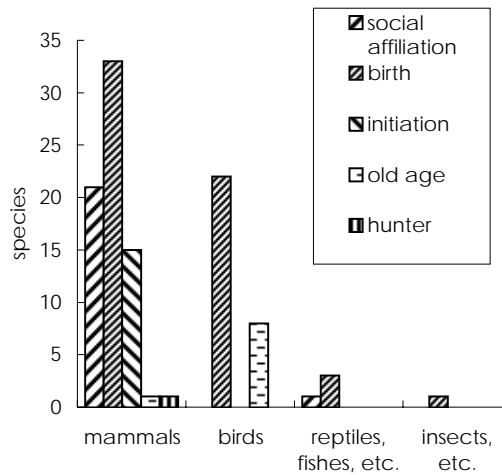
leopard, chimpanzee, and a kind of snake called *oasaka*, are popular *gou* animals and people cannot eat them.

The second type of food restriction is concerned with temporal conditions of an individual such as age, physical and social status, and so on. In the life cycle of each person, especially two periods are considered important and critical: pregnancy and initiation. During pregnancy a woman and her husband have to observe many restrictions, avoiding the meat of animals which are considered to hurt the fetus or disturb the delivery. After the birth, parents are still forbidden to eat 'bad' animals which may bring diseases to the child.

The most serious disease is called *eke* in Efe, and *kuweri* in Mbuti. Although there is some vagueness about the animals which are considered to cause *eke*, a certain number of animals such as the Gabon duiker, elephant shrew, Abyssinian black and white colobus, crested mangabey, African civet, turacos, hornbills, wattle-eyes are unequivocally believed to cause severe *eke*. As animals which bring *eke*, 12 mammal species and 26 birds were mentioned to me. If the parents eat such animals no matter whether intentionally or carelessly, the child will be caught by *eke* which may kill the child. Some animals are said to bring *eke* only if the father kills them or looks at them in the forest.

The initiation ceremony for boys is called *kumbi* and that for girls is called *ima*. During the initiation ceremonies boys and girls have to avoid many animals. Especially 'red' animals are prohibited for them. The bay duiker, blue duiker, bush-pig, red colobus, cane rat, and others are considered as 'red' animals. In total 15 mammals are considered as prohibited animals. If a boy or girl violates that food taboo, the animal would damage the growth of the body of the candidate.

A hunter who has killed an elephant is in a special status and faces special food restrictions. He cannot eat the meat of the elephant which he just killed. If he ate it, he would be unable to do elephant hunting anymore. His wife also has to



**Fig. 6.** Animal category and food restriction type in the Efe.

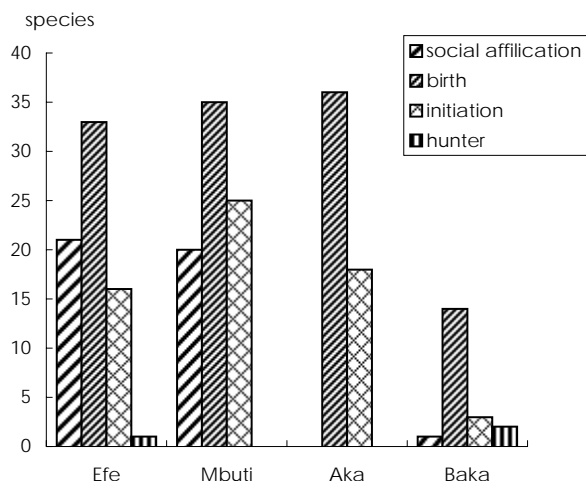
observe this restriction. When the number of elephants he has killed exceeds a certain number, 5 or 10, this restriction will disappear. Even for the Pygmies, however, elephant hunting is very difficult and there are not many hunters who have killed more than such a number. The similar restriction concerning elephant hunting is reported by Sato (1993) for the Baka Pygmies of the northern Congo and the south-eastern Cameroon (Hayashi, personal communication).

There are some animals that are allowed food only for old people. Almost all birds of prey belong to this category. Young people refuse to eat them, saying that they are ‘the meat of old persons.’ If they ate them, their body would be damaged. Old age is also a unique period of the life cycle. This is expressed through the reversal of most food taboos.

Fig. 6 shows the food restriction types observed among the Efe for each animal category. It is clear that food restrictions concentrate on mammals and birds. Especially, food restrictions concerning social affiliation and initiation are found almost only on mammals, and those concerning the old age concentrate on birds. The third group of animals (reptiles, amphibians, and fish) and the fourth group of animals (insects and other invertebrates) have very few food restrictions attached to them. Fig. 7 shows the proportions of each food restriction type among the four groups of African forest foragers (Efe, Mbuti, Aka and Baka). From the figure, a similar trend of food restrictions among the groups is apparent.

#### IV. Animals and Diseases

Forest foragers feel that there are strong relationships between animals and human diseases. The violation of food restrictions brings various diseases to people. The most dangerous disease is, as described above, that caught by children, namely



**Fig. 7.** Food restriction types in the forest foragers.

*eke* or *kuweri*. If parents who have small children eat taboo animals, the children will be attacked by *eke* or *kuweri*. The patient may have very high fever, strong convulsions, and lose consciousness. If not treated quickly and rightly, the patient may die soon. Among the Efe, 12 mammals and 26 birds are recognized to bring *eke*, and among the Mbuti, 30 mammals and 10 birds are said to cause *kuweri* (Ichikawa, 1987).

As a treatment against *eke* medicinal plants are generally used. Various plants are known for this purpose. There are two types of medicine for *eke*: a general medicine and a special one. Several plants are used as a general medicine for the *eke* of various animals. Some plants are used as a special medicine for the *eke* of specific animals. Besides curing *eke*, there are several methods for preventing *eke*. For example, in order to prevent the *eke* of the water chevrotain, the root of *zanza* (*Leptaspis cochleata* Thwaites, Graminae) is burnt and the ash is rubbed into scarifications made on several spots of the body of the child. Sometimes the parents undergo the same treatment. Sometimes small wood pieces of trees which are believed to have effect against *eke* are attached on the string worn around the waist of the child. Such methods are called *dawa*, borrowing a Swahili word. Although a variety of 'exception rules' exists for allowing the consumption of taboo food (Aunger, 1992), it is not a safe way to avoid *eke* by using *dawa*. 'Not to eat' is the best way to get rid of the worry of catching *eke*.

In Efe, the name of a disease caused by an animal is generally expressed by putting a word for disease, *ode* or *onde*, before the name of the animal. For example, *ondetau* means 'the disease of the Gabon duiker,' and *ondekaliango* means 'the disease of the Guinea fowl.' In total 28 disease names which were constructed by this way were collected. Among them, 8 disease are considered *eke*, but others not. Apart from 38 animals that cause *eke*, 19 animals are considered to bring various diseases such as constipation, rashes, eruptions and so on to those who eat them (Table 2).

## V. What Do the Food Restrictions Mean?

Why are so many animals restricted and considered to bring diseases to man? It may be natural to think that food taken into the body would affect it. So it is likely that the food restrictions provide a method of explaining various diseases. It explains why a particular person (or his/her child) gets an illness at a particular time (Ichikawa, 1987), and it provides a means for reducing uncertainty with regard to the causes of illness (Aunger, 1992). This is a functional explanation of food restrictions.

There are other kinds of functional explanations. The symbolic function of food prohibitions is also mentioned by various authors. Here I quote Mary Douglas's interpretation of the animal restrictions in Leviticus:

If the proposed interpretation of the forbidden animals is correct, the dietary laws would have been like signs which at every turn inspired meditation on the oneness, purity and completeness of God. By rules of avoidance holiness was given a physical expression in every encounter with the animal kingdom and at every meal. Observance of the dietary rules would thus have been a meaningful part of the great liturgical act of recognition and worship which culminated in the sacrifice in the Temple. (Douglas, 1966: 57)

The food restrictions observed by the forest foragers can be seen as a method of expressing some symbolic and social messages. As we have already seen, the first type of restrictions expresses the social affiliation of each person. The second type of restrictions expresses anxiety at critical periods and importance of various social and physical stages in the lifetime. Although there is no monotheistic God in the belief of forest foragers, they think about the world, nature, the community, the band and the family with which they live by asking themselves whether they can or cannot eat the animals in every occasion.

## VI. Animals with Ontological Duality

Those functional explanations mentioned above do not seem, however, enough for understanding food restrictions and the relationship between man and animals. Food is not always related to diseases, and not all diseases are caused by the violation of a food taboo. Concerning plant food, very few plants are considered to cause diseases. Why are some animals chosen as prohibited food and others, like most plants, are not? Why so many animals are considered to bring diseases? Why are some animal groups used for such prohibitions and not others? At the base of the food restrictions and the relationship between animals and diseases, there seem to be important ontological characteristics that animals have in relation with man.

Most animals which are important for the forest foragers are active creatures and thought to have intelligence, and even mind or soul. They behave like man and sometimes even harm or deceive man. Although foragers have much biological

knowledge about the behavior and ecology of animals, they also consider animals to be mysterious. As Guenther (1988) pointed out for the San hunter-gatherers, hunters feel that animals are both the same as man and they are other than man. Or man is like an animal and differs from it. The relationship between man and animals is characterized by this ontological duality of animals. Animals are things to eat when man consider them to be other than man, and things to live with when they are considered the same as man. In many folk-tales, animals interact with man, speaking, singing, crying, laughing, and dying just like man. In a manner of speaking, they live sympathetically with man in the forest. There are no boundaries between man and animals in the world of imagination and even in the real world. People feel that animals are their contemporaries living in the forest along with man at any time.

Animals are thus actively and ambivalently interrelated with man. Food restrictions and diseases that animals bring to man are the reflection of such ambivalent relationship between man and animals. Animals are like us and thus eating their meat is filled with various symbols and social meanings. They have to be treated in a proper manner, or they will cause troubles and misfortune such as diseases and quarrels in the human world.

## SUMMARY AND DISCUSSION

Both plants and animals provide many possibilities of uses on which forest people construct their material, social, symbolic and spiritual life. The plants contribute mainly to establish the material world of forest foragers. Plant food does not usually provoke enthusiasm like animal meat does, but it has basic importance for the subsistence of forest foragers. Plants even help man eating animal food, since they provide medicine to treat or prevent diseases brought by animals. Without relying on plant medicine people cannot safely eat a number of animals. Apart from such material relationships, plants have symbolic relationships with man. In various ritual ceremonies as well as in sorcery, many plants are used to perform symbolic tasks. Much symbolic meaning is present in the role of plants as medicine. Although plants are not active like animals, they are eternal. The eternity of plants provides a great contrast to the mortality of animals. This eternity gives man and animals living in the forest a sense of security and certainty for life.

Animals are characterized by an ontological duality due to their activeness and similarity to man. They are very desired and important food for man, but also they are sympathetic co-habitants in the forest. The animals contribute to the subsistence of forest foragers nutritionally and spiritually as 'the true food.' They act as social symbols to remind man of his/her physical and social status, and provide a means to express it to others. They also perform as agents of various diseases. They bring joys and sorrows, happiness and unhappiness to the human world, coloring the life of forest foragers with various hues.

In this way, plants and animals contribute to make up man's life in the forest. Plants and animals are quite important for man in any place, but the interrelationship among man, animals, and plants is not the same everywhere. The forest

foragers seem to have a different relationship with plants and animals from Western people do. In Europe, a hierarchical view of the relationships in nature including man is prevailed because of the strong influence of Christianity and anthropocentrism which has a long tradition since Greek philosophy. In the Bible, it is written that man is created in the image of God, and as such, man is given by God various herbs with seeds and trees with fruits as food and the right to have control over all the animals on the earth (Genesis, the Old Testament). It is said that contempt for and discrimination against animals are the most common attitude in Europe for two thousand years (Ikegami, 1990; 1997). For Descartes, animals were just machines without mind, incapable of conscious experience of any sort (Garber, 1998), which is entirely different from the ideas of the forest foragers. Thus in Western thought, man and animals are strictly separated. On earth, man stands at the top of the hierarchy of nature. Animals are under the control of man. Man exploits animals and plants by the right given by God. The gap between man and animals is particularly wide and deep.

In Buddhism, the natural world is divided into two categories: things called *sattva* and other things. *Sattva* is a Sanskrit concept connotating 'the bright, light, buoyant, wise, good, transparent aspects of nature (Potter, 1987).' The group of *sattva* includes man and animals which have life and soul, and in the other group, the inorganic environment and plants are included. Buddhism is, like Christianity, an anthropocentric religion which puts much importance on the group of *sattva*, that is, man and animals, and recognizes the plants only as food for man and animals (Yamashita, 1977). Thus, in Buddhism, there is a wide gap between animals and plants.

Meanwhile for the forest foragers, nature is not only the object of exploitation by man. Animals and plants have their own values and relationships with man. Plants are not only passive and exploitable resources for man but they interact with forest people in making the world useful and symbolically meaningful. Animals in particular have various and extensive interactions with man. They often behave like humans or, sometimes, supernatural beings. Man and animals are living in the same world sharing the same characteristics. People always talk with the animals which they hunt. Although man uses plants and animals for keeping alive, its use is not one-sided exploitation.

In addition, 'man,' 'plants' and 'animals' are not so clearly separated in the cosmology of forest foragers. Of course there are typical figures which are distinct from other groups in the core of each group, but in the periphery the borders become fuzzy. Some animals are considered like plants or even things without life. Men also become like animals in some cases, and like plants or lifeless things in other cases.

Thus, man, plants and animals which have fuzzy boundaries between them are interconnected by the network of values and interactions. In contrast to the hierarchical cosmology of Western people or of Buddhism, the cosmology of forest foragers seems to be characterized rather by horizontal networking.



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**Appendix.** Diseases related to animals

Name of animal	vernacular	disease name	symptoms, notes
<b>mammals:</b>			
Abyssinian black-and-white colobus	<i>bululu</i>	<i>eke*</i> ( <i>ondebululu</i> )	severe, [eat]**
Uganda red-tailed guenon	<i>gima</i>	<i>eke</i>	[eat]
crested mangabey	<i>angara</i>	<i>eke</i>	[eat]
mona monkey	<i>chabira</i>	<i>eke</i>	[eat]
red-tailed monkey	<i>tepe</i>	<i>eke</i>	[eat]
giant elephant shrew	<i>abeke</i>	<i>eke</i> ( <i>ondeabeke</i> )	[eat]
brush-tailed porcupine	<i>fele</i>	<i>ondefele, oruowi</i>	eczema, [eat]
crested procupine	<i>ikule</i>	<i>ondeikule, oruowi</i>	eczema, [eat]
giant rat	<i>apulu</i>	<i>ondeapuru</i>	difficult birth, [eat]
giant rat	<i>apulu</i>	<i>ondeuku</i>	trouble in anus (child), [eat]
a rat	<i>etizi, katenzi</i>	<i>ondeetizi, ondekatenzi</i>	headache, giddiness [eat?]
a squirrel	<i>makpikpi</i>	<i>ondemakpikpi</i>	convulsion, [eat]
African civet	<i>chamu</i>	<i>ondechamu</i>	constipation, [eat]
golden cat	<i>aka</i>	<i>onde'aka</i>	gun inflammation, [eat]
Bates' pygmy antelope	<i>apopo</i>	<i>ondeapopo</i>	abnormal birth, [eat]
Blue duiker	<i>medi</i>	<i>eke</i>	[eat]
Gabon duiker	<i>tau</i>	<i>eke</i> ( <i>ondetau</i> )	severe, [eat]
Peter's duiker	<i>raka</i>	<i>eke</i>	[eat]
yellow-backed duiker	<i>tochi</i>	<i>eke</i>	[eat]
water chevrotain	<i>bbefe</i>	<i>eke</i> ( <i>ondebbefe</i> )	severe, [eke]
aardvark	<i>ingbo</i>	<i>ondeingbo</i>	wound, [touch]
aardvark	<i>ingbo</i>	<i>ondekombu, kebukebu</i>	leprosy, [sorcery]
elephant	<i>oku</i>	<i>ondeokutapa</i>	difficult birth, [eat]
giant forest hog	<i>balike</i>	<i>ondebalike</i>	bad eczema, [eat]
giant forest hog	<i>balike</i>	<i>fofokundikundi</i>	malnutrition, difficult in lactation, [eat]
bush pig	<i>tiko</i>	<i>ondetiko</i>	wound on the head, [eat]
baffalo	<i>tupi</i>	<i>ondetupilopo</i>	diarrhea
tree hyrax	<i>yama</i>	<i>ondeyama</i>	hoarseness, [eat]
bat	<i>eku</i>	<i>eke</i>	[eat]
<b>birds:</b>			
long-crested eagle	<i>pelekesi</i>	<i>eke</i>	[eat]
an eagle	<i>injo</i>	<i>ondeinjo</i>	bad wounds
slender-billed bulbul	<i>bisolo</i>	<i>eke</i>	[eat]
yellow-vented bulbul	<i>akpupole</i>	<i>eke</i>	[eat]
splendid glossy starling	<i>aleila</i>	<i>eke</i>	[eat]
great blue turaco	<i>kalikoko</i>	<i>eke</i> ( <i>ondekalikoko</i> )	[eat]
lady Ross's turaco	<i>duko</i>	<i>eke</i>	[eat]
honeyguide	<i>girisu</i>	<i>eke</i>	[eat]
little swift	<i>kpelukpelu</i>	<i>eke</i>	[eat]
barbet	<i>kongbe</i>	<i>eke</i> ( <i>ondekongbe</i> )	[eat]
barbet	<i>kpokpodibo</i>	<i>eke</i>	[eat]

(continued)

Name of animal	vernacular	disease name	symptoms, notes
olive sunbird	<i>njeba</i>	<i>eke</i>	[eat]
crested guinea-fowl	<i>kaliango</i>	<i>eke (ondekaliango)</i>	[eat]
a hornbill	<i>mutufu</i>	<i>eke</i>	[eat]
a hornbill	<i>tawa</i>	<i>eke</i>	[eat]
pigeon	<i>ndisi</i>	<i>eke</i>	[eat]
a sunbird	<i>njebalako</i>	<i>eke</i>	[eat]
black and white man-nikin	<i>manakulele</i>	<i>eke</i>	[eat]
<b>birds: (suite)</b>			
orange-cheeked waxbill	<i>ie</i>	<i>eke</i>	[eat]
grey-haeded sparrow	<i>tototo</i>	<i>eke</i>	[eat]
black-headed weaver	<i>wanga</i>	<i>eke</i>	[eat]
village weaver	<i>alei</i>	<i>eke</i>	[eat]
Vieillot's black weaver	<i>aleiesa</i>	<i>eke</i>	[eat]
chestnut wattle-eye	<i>uengbamundurukpa, uekekimundurukpa</i>	<i>eke</i>	[eat]
red-cheeked wattle-eye	<i>uengbamundurukpa, uekekimundurukpa</i>	<i>eke</i>	[eat]
unidentified	<i>chachaki</i>	<i>eke</i>	[eat]
<b>amphibian, fish:</b>			
toad	<i>manatebe</i>	<i>ondemanatebe</i>	eczema, [touch]
catfish	<i>feke</i>	<i>ondefeke</i>	difficult breathing, [eat]
<b>insects, etc.:</b>			
caterpillar	<i>afidi</i>	<i>ondeafidi</i>	obstinate wound, [touch]
caterpillar	<i>tobilichi</i>	<i>ondetobilichi</i>	itching and wound, [touch]
termite	<i>ecu</i>	<i>onde'ecu</i>	black teeth (child), [eat]
termite	<i>ecu</i>	<i>ondeutapo</i>	piles?
termite	<i>eri</i>	<i>eke (onderi)</i>	[eat]
termite	<i>eri</i>	<i>eke (ondechacha)</i>	[eat]
worm	<i>asosou</i>	<i>ondeasosou</i>	ringworm, [touch]
worm	<i>tapa</i>		eye trouble
worm	?	<i>ondekofu</i>	piles?
centipede	<i>tatekomba</i>	<i>mopo</i>	diarrhea

\* symptom of *eke*: high fever, convulsion, fainting in children

\*\* the cause of getting the disease

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